There are numerous possible forms of collaborative research. The first examples that come to my mind are collaboration between and within disciplines, universities and industries, national research collaboration, which involves researchers belonging to the same country and international research collaboration which involves scientists belonging to more than one country. When taking part in a research assessment of the eight Areas of Advance at Chalmers, the bibliometricians at Chalmers Library were interested in all of the above forms of research collaboration. We asked ourselves: Who are Chalmers research partners? How international is Chalmers? And how can “the geography of Chalmers” be visualized? In our quest to visualize the collaboration network of Chalmers, we came across a recent study by Olle Persson and Loet Leydesdorff on the “Mapping the Geography of Science” (2010).

In bibliometrics, research collaboration is studied through co-authorship analysis. One can say that the method used operationalizes the activity studied. From a bibliometrician’s way of looking at research collaboration, contributors in research collaboration tend to become authors, and evidence of research collaboration is therefore found in multiply authored papers. (Hicks & Katz, 1996) As early as 1963, Derek J. de Solla Price reported on a steady increase of authors per publication - indicating that collaborative research was growing in depth and size (Price, 1963). Today, research collaboration is often referred to as being the norm of conducting science. Its activities are believed to have several benefits, for instance cross-fertilization of ideas and cost cuts in research infrastructure and training of personnel. These intellectual and cost related benefits are also believed to grow as the distance between the research partners increases. You are more likely to find a better match the greater search radius you allow. (Hoekman et al., 2010) What is more, articles produced through international collaborative projects tend to be cited more frequently, on average, than their national counterparts. (Narin et al., 1991; Hoekman et al., 2010) Over the years, numerous initiatives have been launched to bring different constellations of researchers, disciplines, universities and industries together in larger groups. (Katz & Hicks, 1996) On the European level, there is the European Union’s research policy, which encourages formal international linkages among member states, through the program European Research Area (ERA). Central to the research policies and activities within ERA are the Framework Programmes, which are designed to promote R&D cooperation between the EU member states. Its’ main purpose is to improve research collaboration and communication between scholars, researchers, engineers and industries (Hoekman et al., 2010).

To get ideas on how to visualize the geography of Chalmers we turned to recent bibliometrics literature on the subject of mapping. Leydesdorff and Persson (2010) report on newly available methodologies for projecting research collaboration patterns (“the geography of science”) on the world map. With Leydesdorff and Persson’s thorough manual in hand, a map of all of Chalmers articles, reviews, proceeding papers and letters available through Web of Science published in 2011 was produced. The data was collected from Web of Science; the names and the locations of institutions occurring in the address field were then extracted. These were in the next step put into GPS Visualizer’s geocoder (a program on the internet of free use). Through the geocoder, the geographic positions of the institutions (longitude and latitude) were produced. In Excel, the positions produced through the Geocoder were added to the names and frequencies of the institutions. The text string was produced in Excel was again put in GPS visualizer and a map was made. On the map one finds 873 circles, i.e. 873 institutions other than Chalmers are present in the address fields of the selected publications. A circle on the map represents a contribution to one or more of the publications, i.e. if

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1 http://www.chalmers.se/en/Research/Pages/default.aspx
2 http://www.lib.chalmers.se/libraryinfo/
3 Among other things, the manual also offers instructions on how to integrate Pajek into the geographic mapping.
4 http://www.gpsvisualizer.com/
e.g. the University of Gothenburg is present in any of the address fields of the publications mentioned from 2011, you will find a circle representing University of Gothenburg put on the coordinates of the city of Gothenburg. The size of the circle is dependent on frequency. As you may have noticed, the circle representing University of Gothenburg is the biggest circle on the map – University of Gothenburg is also the institution that is most frequently occurring in the address fields of the Chalmers publications published in 2011. When looking at the map, you’re also able to zoom in and out. If you are interested in a certain region or country, e.g. Germany, double click where you want to put your focus while zooming in, then on the left hand side of the map, you find a zoom in and out function.

As the world map shows us most of Chalmers research partners are situated in Europe. This map also shows us that there is a spread of research partners across all continents. A closer look at the map shows us the names of research partners, ranging from academia to industry. A next step in this small quest could be to “redraw” the map at a later point, and see how and if the geography of Chalmers changes over time. Now we ask: *How will the geography of Chalmers look in a few years’ time?*
References


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http://www.lib.chalmers.se/libraryinfo/, 2011-11-30, 09.35

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